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ABSTRACT

The publication describes the process by which a portion of the Management Information System for Occupational Education (MISOE) Census Data System (CDS) was field-tested in a sample of six Massachusetts schools. It is intended to provide guidelines for those who will be responsible for the planning of statewide implementation of the fully developed Census Data System. Transcripts of the presentations and discussions among MISOE and school staffs at an introductory presentation, in a workshop, during an individual contact, and during a data collection experience comprise a large part of the document. The workshop transcript includes instructions for reporting information in the CDS terminal objectives (TERMOB) Fall reporting booklets. These instructions applied only to experimental reporting booklets used in the CDS Fall Report field test and are not necessarily in the sequence required by the final version of the Fall Report, as the intent of the document is to provide only a basis from which a full-scale plan for workshops may be modeled, not to provide a step-by-step process applicable to the Fall Report as developed. An outline of the field test plan and visual aids which were utilized in the field test are included in the document. (Author/AJ)

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CDS DOCUMENT #9

WORKSHOP GUIDELINES

for the

MISOE CENSUS DATA SYSTEM FALL REPORTS

August, 1974

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PREFACE

This publication describes the process by which a portion of the MISOE Census Data System was field tested in a sample of six schools. It is intended to provide guidelines for those who will be responsible for the planning of statewide implementation of the fully developed Census Data System.

Included are (1) an outline of the field test plan, (2) transcripts of the presentations and discussions among MISOE and school staffs and (3) visual aids which were utilized in the field test.

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INTRODUCTION

MISOE is an information system designed to provide comprehensive data to managers of occupational education on which rational management decisions can be based. It is a complex system offering enormous information capabilities and features instant data retrieval with which a manager can interact.

MISOE is comprised of two major sybsystems; the Census Data System (CDS) collects and stores basic census data for all school systems. It includes all of the data currently being collected by the Department of Education Annual Federal Report with the exception of the follow-up data which is included in the MISOE Sample Data System. Essentially CDS contains descriptive information systematically structured in a manner which allows it to be used as a basis for sampling evaluative research studies. The MISOE Sample Data System (SDS) collects and stores data on a sampling of students (from CDS) to determine cause and effect relationships in the analysis of educational programs. It includes an input battery which describes the characteristics of students as they enter programs, a process battery which describes the nature of the teaching process to which the student is exposed and follow-up studies (called impact battery) to examine different lifestyles of program completors. Essentially the Sample Data System provides the means to evaluate the long range effects of occupational education.

This report is concerned with a portion of the MISOE Census Data System that was field tested and which provides immediate benefits. This portion of the system, the Fall Reports, has short term potential in and of itself to serve as a basis for determining program effectiveness and establishing justifications of program costs. It also provides immediate benefits in the form of an educational management by objectives (MBO) system. This report describes the workshop process which was utilized in implementing the Fall Reports.

PLAN

The entire MISOE Census Data System collection package was reviewed to ascertain the critical data types and forms that would be field tested. In examining the data types, it was found that much of the information was already considered to be 'collectible' in that it was part of the existing data collection process operating through the Division of Occupational Education (the Annual Federal Report). It was determined that only the enrollment forms would be tested at the school head (principal) level because of unfamiliarity with those forms. The administrative and instructional staff data of the school head reports were considered to be 'collectible'.

The major thrust of the field test was focused at the Department Head level to collect job-entry skills offered by program. This necessitated educating the instructional staff in the concepts of performance objectives as developed by MISOE and to execute the data collection by means of a process of conferences and workshops. The process was developed in a manner which could be utilized as the basis to implement the entire Fall Report in all schools offering occupational programs across the state.

The participating school systems were:

1. Shawsheen Valley Vocational-Technical School District
2. Nashoba Valley Vocational-Technical School District
3. Brookline School System
4. Newton School System
5. Northeast Metropolitan Vocational-Technical School District
6. Quincy School System

Of the six participating school systems, three were selected which had served as MISOE laboratory schools and whose staff were familiar with MISOE's activities, and three school systems were selected which had no

prior exposure to MISOE. The following aspects were the subject for testing and validation:

1. Terminal Performance Objectives (TERMOBs) developed over a two year period for 19 occupational areas. Format, TERMOB coverage per program, etc.
2. Enrollment forms, procedures, mechanics of system
3. Overall value/feasibility of CDS to teachers, department heads, administrators.

Each step of the implementation process, as a consequence of the field test, is briefly summarized below:

(1) Introductory Presentation (School and Department Head) - An introductory presentation of forty-five minutes' duration plus a question and answer period for school heads and department heads was scheduled to explain MISOE, the Census Data System and its immediate and potential usefulness. Emphasis was placed on the concept and application of terminal performance objectives. Reporting booklets were distributed with an introduction to the workshops which followed (preferably during the following week).

(2) Workshops (Department Heads) - All forms were reviewed and completed where data was readily available. Special emphasis was placed on validating curriculum outlines and reviewing terminal objectives by program.

(3) Workshop Follow-up - There were individual on-site contacts with each department head in every school to ensure there was adequate understanding of the forms and that their completion was ensured.

(4) Data Collection Conference - This was an informal meeting of department heads, school heads and superintendents after completion of the Fall Report to solicit a candid appraisal by all participants relative to the overall value of the Fall Report

For those who are interested, the results of this field test are reported in detail in Document No. 8, Field Test Results of the MISOE Census Data System Fall Reports, June, 1974 of the MISOE Census Data System Documentation Package. A brief summary of the results of this report are as follows and are included here as a matter of interest and to provide a framework for the description of the process which follows in later sections of this report.

Teacher/Department Heads - 100 percent agreement on value, adaptability, potential of the Fall Report information, usefulness of TERMOBs. (Progress Record Charts, Accountability, Curriculum Development, Budget Justification, etc.)

Superintendent/Director/Occupational Coordinator - Unanimous acknowledgement of value of the Fall Report as a management tool.

1. TERMOBs - overwhelmingly favorable reaction by teachers, department heads. Validation of objectives as marketable skills, relevance to program clarity. Approval of open-ended structure, flexibility of TERMOB format. While percent of TERMOB coverage of program varied 50 percent to 100 percent, average coverage for 19 programs - 80 percent. No impediments to development of full coverage for all programs.

2. Enrollments - Mechanics, forms for providing enrollment data - 95 percent applicable, 100 percent adaptable.

3. Overall Value of the Fall Report - overwhelming approval, documented through anonymous written questionnaire/opinion survey of teachers, administrators. Video-taped data collection conferences in all six schools.

The following sections contain suggested material for each session. It also contains the visual aids that are helpful to support this activity.

PROCEDURES

Introductory Presentation

Introduction

On behalf of MISOE, the Management Information System for Occupational Education, I would like to thank you for coming here today. A full explanation of Project MISOE can be found in the Journal for Research and Development in Education, and copies have been placed in the library at your disposal.

OH 1*

Purpose

MISOE has developed an information system for occupational education, connecting what goes on in the classroom (input) with the results of that educational experience (output). What happens in the classroom or shop or kitchen is really the interaction of the student and the teacher. This creative experience is the primary function of education. Our information system imposes no standards on the teaching process. Instead it deals with the management function in education - a secondary but a very important function. The teacher/department head plays a vital role in the management process. Student grouping, scheduling, curriculum committees, budget development, equipment orders, program changes - all of these involve the teacher/department head in his/her management function. Our information system connects what goes on in the classroom with the management function.

OH 2

Fall Report Data Types - Overview

The portion of MISOE that we are concentrating on today is the Fall Report, which relates educational inputs with outputs. To determine this relation, you have to know the nature and scope of an occupational program

*OH 1 - Overhead Slide No. 1. Refer to page 47 of Appendix for description of Overhead Slides. These overheads are correlated with the text and should be referenced as text is being read.

OH 3 (what's happening in the classroom), the number of students involved in a given program by student group (input), and the job-entry skills the student

OH 4 acquires by the end of the program (output). The nature and scope of a program can be described by its USOE code (U.S. Office of Education) which describes in detail a given program by code number. The number and grouping of students involved can easily be obtained from enrollment data. Finally, the job-entry skills of program completors (actually what they are capable of doing) can be described by terminal performance [illegible] which we call TERMOBS. TERMOBS describe occupational capabilities [illegible] student is

OH 5 expected to perform at the end of a given program. Instead of instructional or enabling objectives the TERMOB is much more comprehensive and focuses on a marketable job-entry skill. Because it focuses on program completors, it doesn't affect or involve the actual teaching process or the methods or direction of teaching these job-entry skills. In other words, the MISOE system, by connecting programs with enrollments with terminal objectives (or TERMOBS), can provide a new support tool to the education process. We all know what is going <u>into</u> the process of education - number of teachers, number of students, equipment, space and especially cost. All of this is the <u>input</u> into education. Our system, by focusing on the number of job-entry skills acquired by completors of a given program, provides very important <u>output</u> information. We are going to give you a complete explanation of the TERMOB. But first, let's examine its role in educational output and how it can provide better information.

<u>Potential Benefits</u>

Vocational education is constantly subject to close scrutiny because of the high per pupil cost of producing skilled tradesmen and

technicians. In fact, in the last report of the Massachusetts Advisory Council on Vocational Education, dated October 1973, it was recommended that it be considered to utilize vocational schools and regional vocational schools as area resource centers (as they are in New York State). Under the category "Major Observations and Findings" the Council reported substantial concern over financial issues and directed the Council's attention to a look at financing vocational education and the general problem of relating costs to results, or cost effectiveness. The Council found that insufficient data exists today upon which to make long range commitments to any one delivery system. As the State Plan implies, a continuation of a major program to expand vocational education, a program involving some 180 million dollars, the Council suggests a deeper look at alternative models, particularly a consideration of transforming the area schools into resource centers. The Council believes it a mistake to consider the four-year cycle program, including and perhaps best exemplified by the regional vocational school, as the optimum delivery system. Data that are available at the present time within the State and nationally are not adequate to support such a decision. This position, as acknowledged by the Council, is based on limited data, but it is based on the only data that is available at the present time. It is based on input and not output. TERMOBS provide the means to accurately describe outputs (results) of occupational programs. When merged with input information - student number, type and program cost - a basis for cost justification and a determination of program effectiveness is at hand. For
OH 6 example, let's look at two hypothetical schools offering automotive mechanics programs, each producing twenty-five program completors per year. School A produces all completors in all programs at a cost of $4,400, while

School B produces the same number of completors at an average per pupil cost of $3,000. At present, this is the only basic information available for occupational education. All of this is input information. The Fall Report includes a description of the number of job-entry skills (TERMOBS) acquired by program completors. With this information, a useful comparison of the two schools could be made. It is assumed that these costs are, in fact, program costs and not cost averaged over all programs. Although the cost per completor at School B is $1,400 lower than School A, it is noted that School A produces automotive program graduates that have acquired twenty more (55 vs. 35) job-entry skills (TERMOBS) than those students graduating from School B. Hence, the cost difference can be explained in terms of additional skills which the School A graduates have learned which, it can be argued, better prepares these students for jobs as auto mechanics.

The purpose of this purely hypothetical example is to demonstrate the tremendous advantages to be gained from the application of terminal performance objectives (TERMOBS) in the management of education. We will review other potential benefits of the system as we proceed through the system's implementation.

Now that we've seen how our system can provide much needed information, we'd like to explain the format and design of an integral part of that system, the terminal performance objective, or TERMOB.

OH 7 Terminal Performance Objectives

A major component of the Fall Report is the TERMOB. TERMOBS are comprehensive performance objectives which focus on a single large learning

assignment and can readily be identified as job-entry skills. They describe complex skills that the student should be able to perform upon completion of a given occupational program. Now let me make a note on this word "perform". Our TERMOBS deal with psychomotor skills. That is, they are things that the student can do - a product he can make or a service that he can provide. They don't deal with cognitive or affective areas of learning. We don't deny that what a student knows is important. Nor do we deny that what he appreciates is important. But these areas of learning enable the student to perform, and performance is psychomotor. Again, TERMOBS describe complex skills that a student should be able to perform, upon completion of an occupational education program.

TERMOBS are specified in a standard three-part format: the condition, the performance and the extent. The condition statement sets the stage. It specified the environment in which the task is to be performed. It provides supplies, equipment, tools or anything else that is required to execute the performance. The condition applies generally to the entire objective. Here is an actual objective from the Auto Mechanics program. You can see that the condition provides: a late model American automobile, a service manual, basic mechanics tools, brake pads, lathe, etc. These are the things that are needed to complete the performance. The performance statement specified the job-entry skill; in this case, "overhaul brake system". That's the job-entry skill. It is comprehensive and focuses on a single large learning assignment. Listed below the general statement of performance are subskills. This is a list of the subskills required to do the job. In this case, and in most cases, the subskills are the operations involved in doing the performance, the job-entry skill.

OH 8

The extent portion of the TERMOB delineates now well the job is to be done, and how long the job should take. Here in the general statement of extent it says that the brake system is working properly to the approval of a board of expert raters and it is to be completed in flat rate time plus 50 per cent. Listed below the general statement of extent are what we call "procedural extents". These extents apply directly to specific performance statements here and they are coded to match up with them, 3.02 matches up with 2.02, and so on. These are very general in this case as they are in most cases.

TERMOBS are flexible and open-ended and can be adjusted for local use. Here is another Auto Mechanics TERMOB "replace rear axles", that has been adjusted to suit someone's needs. In this case, they added two items to the condition, an axle seal puller and an axle seal installer. Extent statements can be changed also. It's not correct to allow 2-1/2 hours for every rear axle. Rear axles are different in different automobiles. Here this TERMOB has been changed to give a time extent of flat rate time plus 50 per cent. For a secondary school graduate, this should be more reasonable. Another possible change would be to add to the condition statement: "foreign automobile" where it says late model American automobile. This change would make a wider ranging objective.

OH
9-10

Instructional Division and Unit Outline

The second component of the Performance Objective System is the Instructional Division and Unit Outline. This outline is designed to be used to specify a program's curriculum. We are not trying to suggest that this outline is the best instructional outline or that this is the one that you should follow or that this even totally describes your program. What we

think we have is an outline that is adjustable to your program. With minor modifications we can make this instructional division and unit outline delineate the instructional content of any school that teaches the particular program.

OH 11 This is one of four pages of the instructional division and unit outline for the Machine Shop program. You can see in one division, Milling Machine, there are a number of instructional units listed. Now you may not teach these units as units but you probably teach this material somewhere in your program. Boring, drilling, reaming, tapping, milling and so on are all units contained in an instructional division called Milling Machine. This is how ou look at your program; from an instructional point of view.

TERMOB Division and Unit Outline

MISOE, on the other hand, looks at your program from an output point of view. We look at the product of your program, the student, and we want to spell out what he can do. We outline a program by its terminal per-

OH 12 formance objectives into TERMOB divisions and units. Here, in the TERMOB division and unit outline for Machine Shop, we have Milling Machines as a unit in the division on machines; and within this unit are about six TERMOBS, that is, large learning assignments, and each covers a number of instructional units. In one TERMOB on Milling Machines a number of the operations that can be performed on the Milling Machine are specified as part of the performance. We think you can see now how our TERMOBS are larger, more comprehensive objectives than you might be used to. Each one focuses on a marketable job-entry skill, w'ch may encompass several sub-skills. Collectively, these TERMOBS can pretty well describe your particular program. It might be useful to discuss some benefits of TERMOBS from our perspective.

Immediate Benefits

We can see that collectively the TERMOBS provide a logical and concise behavioral summary of a given occupational program. There are 20 program areas for which we have written TERMOBS, and the average number of
OH 13 TERMOBS per program is about 55. We believe each of these 20 programs can be described behaviorally and logically by our Terminal Performance Objectives. Of course, we are very interested in your opinion of our TERMOB's ability to describe your program.

TERMOBS also provide a fresh approach to goal specification of a program without requiring the teacher to write hundreds of objectives to describe program outcomes. In other words, we have already developed in the form of job-entry skills, the outcomes sought by your instructional program. Of course, your validation of our coverage is vital, and we are very interested in finding out from you just how close to the mark we've come. We need your help in refining our TERMOBS to make them more accurate and even more complete.

The TERMOBS or job-entry skills which we've developed over a two-year period are stated in a standard format which you've just seen. We're asking you to look over these objectives, correct them where you think corrections are needed, add to them where you think additions are needed, and even contribute whole new objectives, if you think the coverage is not what it should be. Your input now, as well as the input from other teachers and department heads who are going over these skills at the same time, will help us continue to update our objectives for each occupational program.

OH 14 TERMOBS are also extremely useful as a basis for communication. They can be a means of communicating with parents and students, help you to

provide students with a graphic description of the program skills they will be expected to acquire by the end of the program. On an exploratory basis, we think TERMOBS can help the student in making a career decision. Also, TERMOBS, could be used with advisory committees to provide more concise statements of the capabilities your students acquire or the capabilities that the advisory committee suggests they acquire for each occupational program.

TERMOBS are also of value to administrators in enumerating program objectives on which budgets, staff and expenditures can be justified.

OH 15 Programs - Enrollments by USOE Code

As we described previously, TERMOBS can provide a means to demonstrate the relationship between the skills offered in one department in one school versus skills offered in the department in another school. Let's take an example of a program, the Metalworking program in most schools. If we look at this program for Grade 12, we notice the USOE code which describes the program only as a Metalworking program. There are 20 students in the program. The average cost per completor (information not now

OH 16 available) is $4400. This is really insufficient information for useful program modification or improvement. Now let's look at the information our system provides. We can now enumerate specific skills which are acquired by the 12th graders in two different student groups in the program. We can see the cost per completor in this program like we can above but we can see the results as well; the number of job-entry skills the students in Sheet Metal and Welding groups have acquired. In other words, output information or what results after we spend the money. Our information system describes enrollments by student group and connects that to the USOE code describing

the program as you see here, Welding differentiated from Sheet Metal, and the number of job-entry skills the students acquire in each group. A Student group is defined as the highest order grouping of students receiving identical instruction throughout the program. If a group of students are studying Welding but not Sheet Metal Fabrication, then they would not be classified under the broad grouping of Metalworking as is done now, but the particular student group would be delineated. Welding would be differentiated from Sheet Metal Fabrication. The means by which we numerically differentiate between Welders and Metal Fabricators is the USOE (United
OH 17 States Office of Education) code. This is an integral part of our system. You can see now on the screen the USOE code for an Automotive Mechanics program. It describes the various experiences involved in an Automotive Mechanics program of instruction.

Now that I have briefly explained the USOE codes, the student groups and enrollments and the TERMOBS and how we use them, I'd like to explain for you what we would like you to do for us during the next week. At this point I'd like to distribute some of our materials for you to look over between now and our workshop session next week. We expect that you will carefully review these materials, and we will help you report the information during the workshop session. Our final evaluation session will provide you an opportunity to tell us what you think about our system in a way that will help us make it increasingly useful to you. Thank you for attending today's session, and we would be happy to answer any questions you might now have.

Workshop

Introduction

I would like to welcome you back to the second part of the MISOE Fall Report Data Collection, the workshop session. After describing how to complete the enrollment forms, we will review, in depth, the terminal performance objectives (TERMOBS), including an explanation of how the TERMOBS can describe your instructional program. We will now distribute the TERMOB reporting booklets to you, and if you have any questions as we proceed, please don't hesitate to ask them.

Reporting Booklet

At our last meeting we presented an introduction to the MISOE system and indicated that today we would help you fill out the booklets. The forms for reporting that information are contained in your reporting booklet, together with instructional and TERMOB outlines for your program and the TERMOBS proper.

NOTE

The following instructions apply to the experimental reporting booklets which were used in the field test. As a result of the inputs received during the test, several modifications and revisions were made in the forms which would facilitate the reporting process. These changes are reflected in the final version of the Fall Report which is presented in Appendix B. Therefore, the instructions described below are not necessarily in the sequence required by the final version of the Fall Report. The intent of this Appendix D is to provide a basis from which a full scale plan for workshops may be modeled and is not in fact a step-by-step process which is applicable to the Fall Report as developed.

The following legend explains the grouping of School System ID Numbers:

001 through 351 ..... Municipal School Districts

390..... Community Colleges

392 ..... Junior Colleges

401 through 408 ..... Vocational School Districts

600 through 780 ..... Regional School Districts

801 through 885 ..... Regional Vocational School Districts

910 through 915 ..... County Agricultural Schools

Each secondary and post-secondary school is listed along with its corresponding school number.

Department ID Numbers

The Department ID Number is to be assigned to each department by the responsible department head. These are six-digit numbers which are to be taken from the USOE codes, the Federal government's official means of program description. The six digits to be used as the Department ID Number are the six digits of the USOE Code number which describes the major occupational instructional area of the department; for example, 14.0000 for Business and Office Departments, 17.0302 for Automotive Mechanics Department, 17.0301 for Automotive Body and Fender Departments. If it is not possible to identify a major instructional area, or if there are two or more different programs within the same department, use the highest code among the given areas to identify the department. For example, in a department with an Electrical program (USOE Codes 17.1400 and 17.1002) the department number which should be used is 17.1400.

Level Code Numbers

Programs offered within departments can be described by their grade levels and are to be coded as follows:

30.0 Secondary - Occupational Education Programs designed for youth in grades 9-12.

40.1 Post Secondary - Certificate - Post-secondary occupational education programs which provide only a certificate upon successful program completion and are designed primarily for youth or adults who have completed or left high school and who are available for an organized program of study in preparation for entering the labor market.

40.2 Post Secondary - Associate Degree - Post-secondary occupational education programs which provide an Associate Degree upon successful program completion and are designed primarily for youth or adults who have completed or left high school and who are available for an organized program of study in preparation for entering the job market.

59.1 Junior and Community College - Certificate - Occupational programs offered in two year colleges which provide only a certificate upon successful program completion and are designed primarily for youth or adults who have completed or left high school and who are available for an organized program of study in preparation for entering the labor market.

59.2 Junior and Community College - Associate Degree- Occupational programs offered in two year colleges which provide an Associate Degree upon successful program completion and are designed primarily for youth or adults who have completed or left high school and who are available for an organized program of study in preparation for entering the labor market.

70.0 MDTA - MDTA programs are funded under the Manpower Development and Training Act, P.L. 87-415 administered jointly with the Division of Employment Services for the training of disadvantaged individuals over 16 years of age.

Type Code Numbers

The type code describes the kinds of students served by each occupational education program. The following 2-digit codes specify student types and are to be entered in the appropriate space on the cover page.

01 - Regular Occupational Education Programs - Students served by regular occupational education programs represent the general population of students in that they are not organized on the basis of being handicapped or disadvantaged or of requiring a remedial program. However, some handicapped and/or disadvantaged students may be enrolled in a regular occupational education program.

02 - Disadvantaged Occupational Education Programs - Students served by a disadvantaged occupational education program have been selected on the basis of cultural, academic or economic disadvantage. These programs are exclusively designed to serve disadvantaged students who cannot succeed in the regular program.

Cooperative and Workstudy Arrangements

In many instances programs are structured to accommodate students who wish to be enrolled in educational programs and be simultaneously employed. The following describes arrangements which currently exist in the State to meet the needs of such students. Cooperative and Work Study arrangements are not programs as such but are used to describe curriculum designs. The following definitions are offered to assist in the completion of Tables 1 and 2 in the Reporting Booklet:

Cooperative - (State Approved) Instruction for persons enrolled in a school who, through a written cooperative arrangement between the school and employers, receive part-time vocational instruction in the school and on the job training through part-time employment.

Work Study - A State approved program of temporary employment for a student who has been accepted for enrollment, or is already in a vocational program and is in need of the earnings from such employment to commence or continue his vocational educational program. The employment arrangement is not a coordinated part of the student's vocational program.

Session Code Number

Session Code numbers identify whether programs are offered during the day, evening or summer. The following one-digit codes are to be entered in the appropriate box on the cover page:

1 - Day Session

2 - Evening Session

3 - Summer Session

Personal

Please enter the name of the department, your name, title and telephone number, and the date and your signature at the bottom of the page.

USOE Codes

The USOE coding system is used to describe occupational programs of instruction by relating student enrollment to the occupations for which they are being trained, and with the job-entry skills which they are acquiring. However, in many instances there are distinct student groups acquiring different skills within an instructional program. Our reporting system accommodates each educational situation by providing the means to categorize students accurately by student group, using USOE codes.

USOE codes are numerical descriptions of instructional occupational areas for which students are learning job-entry skills. Seven major occupational

areas of instruction are identified by the two digits to the left of the decimal point of a six (or eight) digit code number as follows:

01 Agricultural Occupations	09 Home Economics Occupations
04 Distribution & Marketing Occupations	14 Office & Business Occupations
07 Health Occupations	16 Technical Occupations
	17 Trade and Industrial Occupations

Numbers to the right of the decimal point describe increasing occupational specificity by which to classify students enrolled in instructional areas; for example:

First 2-digit position:

14 OFFICE OCCUPATIONS

Second 2-digit position:

14.02 BUSINESS DATA PROCESSING SYSTEMS OCCUPATIONS

Third 2-digit position:

14.0202 PERIPHREAL EQUIPMENT OPERATORS

Fourth 2-digit position:

12.020201 KEYPUNCH AND CODING EQUIPMENT OPERATORS

Six-digit numbers are usually sufficient to classify most instructional programs in the State.

Student Enrollment - Table I

Table I in this booklet, page 4 requests data on student enrollment in the final grade only. It is designed to gather enrollment data by grade, USOE code, student characteristics, and job-entry skills (TERMOBS). In many occupational programs, all students will be acquiring the same skills. Therefore, the program is reported as having only one student group. If a situation exists

where different students are acquiring different skills, please enter each student group in Table I by the USOE code that best describes it.

- Enter the grade level for each student group on line 2.
- Enter the USOE Code(s) applicable to each student group on line 3.
- Enter your student group (the student group is the highest order grouping of students receiving identical key instruction) enrollments by sex and majority/minority characteristics. (A minority student is a member of one of the following ethnic or minority groups: American Indian, Negro Oriental, Spanish surnamed American or where English is a second language).
- Enter all applicable TERMOB numbers for each student group in the columns provided on line 6 at the bottom of the page. (Complete Final Grade only).

We want to relate these program completors with skills that they have acquired. Each of you has within your reporting booklet an index of TERMOB statements. It lists the TERMOB number and the corresponding performance statement. Please look at each statement and make a judgement as to whether your students would be capable of performing that skill upon graduation.

Look through the TERMOB statements for your program now, and decide whether or not your program completors will have acquired those skills by graduation. Write in all TERMOB numbers that apply directly below the appropriate student group (101, 102, etc.) If you think a TERMOB statement comes close to a skill your students will have, include it in your list.

Student Enrollment - Table 2

Turn now to page 5, Table 2, which is the form for collecting your enrollment for all grades below final grade. Table 2 is identical to Table I

except that there are no TERMOB boxes since these lower grade students are not program completors. Here you fill in your enrollment for each grade below final grade under the appropriate USOE code, by student group.

Instructional Division and Unit Outline

Please turn to page 6, Table 3. This is the instructional division and unit outline for your particular program.

The instructional content of occupational programs in Massachusetts as it is represented by MISOE was obtained through a broad based input by vocational teachers throughout the State. Each occupation program is described by its major divisions of instruction, which are subdivided into specific units of instruction. Examine the Instructional Division and Unit Outline and determine if it contains all of the instructional content of your program. Check the appropriate response at the top of the page. Please circle the divisions and units which are taught and indicate (on the following page) those divisions and units which must be added to represent your entire program.

Begin by looking at the first unit in the first division and decide whether that unit, in any form, is included in your instructional program. If it is included, please circle it and continue down the page, circling all units and divisions that are a part of your instructional program, (whether it is as we have stated it or is disbursed some other way).

If there are any units or divisions that you teach which are not listed in our instructional outline of your program, please add them in Table 3A, Additional Instructional Divisions and Units". If you find that we have listed units or divisiors that you do not teach, do not circle those units or divisions.

TERMOB Division and Unit Outline

Table 4 is the TERMOB Division and Unit Outline for your particular program. While vocational/technical schools classify their programs by instructional content, MISOE classified occupational programs by divisions and units of job-entry skill areas, and the specific job-entry skills (TERMOBS) acquired. Refer to Table 4 for a complete list of the TERMOB divisions and units. Examine the TERMOB Division and Unit Outline and determine if it contains all of the job-entry skills your students learn. Check the appropriate response at the top of the page and circle the divisions and units which are acquired.

The units in the TERMOB Division and Unit Outline are larger than those found in the instructional outline. Each unit encompasses more of the curriculum. Decide whether your students acquire job-entry skills in these areas and circle those that apply.

Table 4A is provided for any additional units or divisions in job-entry skill areas that you cover in your program, but that are not listed in the TERMOB Division and Unit Outline.

Terminal Performance Objectives

A concise description of the TERMOB format was presented in our introductory presentation. You should review each TERMOB statement to determine its applicability to your student groups. A major purpose of this data collection is TERMOB reporting.

The procedure for TERMOB reporting is straightforward and easily completed by following the instructions. Open your booklets to the first TERMOB, #001. The left hand page presents the TERMOB we have described the job-entry

skill. The right hand page is provided for you to modify the TERMOB as necessary. The procedure is as follows:

Step 1 - Examine the top of the page, listing the program, division and unit discriptors of the TERMOB. Are these descriptors appropriate for your department? If not, please enter your modifications on the right hand page.

Step 2 - Examine the boxed 2.01 statement. This is the heart of the TERMOB. Does this represent a job-entry skill in your program? If it does, place a check in the space provided to the left of the statement number. If it does not, use the appropriate section of the right hand page to specify the modifications necessary so that it represents the terminal performance ability of your students.

Step 3 - Examine the list of operations or subskills in the Performance section, 2.02 up to 3.00. Are all operations necessary to successfully complete the general performance statement (2.01) listed? If not, list any additionally required steps on the right-hand page in the appropriate section. Be sure to include the appropriate code (e.g. 2.07). Is there a preferred sequence of completion of these operations? If there is, indicate the sequence by placing numbers in the spaces provided to the left of the statement number. If not, place all "1's" in spaces. Do not place any mark to the left of procedures not judged necessary for the completion of the performance statement.

Step 4 - Examine Section 1.00, Condition. Are all tools, supplies, and equipment necessary to complete the performance, listed? If

so, place a check in the space to the left of each numbered item that applies. Use the appropriate section of the right-hand page to list any additional condition items.

Step 5 - Examine the boxed 3.01 statement. Does this express the overall extent to which the performance should be accomplished? If it does, place a check in the space provided to the left of the statement number. If it does not, use the appropriate section of the right-hand page to specify the necessary modifications.

Step 6 - Examine the list of operational extents in the Extent section, 3.02 up to 4.00. Each statement here corresponds to the similarly numbered statement in the Performance section. Does each statement express the extent to which the corresponding operation should be accomplished? If each does, place a check in the space provided to the left of the statement number. If it does not, use the appropriate section of the right-hand page to specify the necessary modifications.

Note: If additional operations were specified in Performance sections, extents for these operations should also be specified on the right-hand page.

Step 7 - Repeat the previous six steps for each TERMOB which is applicable to your program. When you have completed this, go on to Step 8.

Step 8 - Examine the TERMOBS collectively. Are all of the job-entry skills that your students learn represented by the TERMOBS? If not, blank forms have been included for you to contribute the additional skills your students learn.

Step 9 - Examine each appendix of this booklet, i.e., Basic Office Supplies, Basic Tools or equipment. Place a check next to

each item which is used in your department. Indicate any additional items below those listed.

This is the procedure for TERMOB reporting we suggest you follow as you go through each TERMOB in the booklet. The procedure will now be briefly reviewed, and you may now begin review of the TERMOB before you.

Procedure - TERMOB Review

1. Check upper right-hand corner for Division, Unit and TERMOB number.
2. Examine 2.01 Statement to determine if it is a job-entry skill. Assess the degree of difficulty.
3. Examine the sub-skills or procedures directly under 2.01 Statement. Determine if all necessary sub-skills are included (all operations necessary to attain 2.01 Statement). Correct sequence if necessary.
4. Check Condition Statements, are there sufficient tools, supplies, etc., for the Performance to be done.
5. Examine the Statement of Extent (3.01) assess degree of difficulty. (time). Make changes, clarifications where necessary.
6. Examine the procedural Extents. Make changes, clarifications where necessary.
7. Determine if anything important has been ommitted in any section.
8. Contribute additional TERMOBS that are included in your program.

Additional blank TERMOB forms for providing extra TERMOBS and forms for providing additional 2.01 Statements (job-entry skill Statements) from which we will develop a TERMOB are included in your TERMOB reporting booklet.

That concludes our workshop for today. If you have any further questions, we will be glad to answer them. In addition, over the next ten days a member of our staff will be contacting you individually in case of questions or problems you might encounter as you go through the objectives. We will be back to collect the data on _____ (date).

Individual Contact

Brief individual contacts are scheduled with each teacher/department head in order to insure complete understanding of a new and unfamiliar system. These contacts were in the form of informal meetings in the classroom or office averaging ten minutes in length to minimize disruption of the working day. Since any information system puts a premium on details, the importance of these brief sessions is underscored. In addition, to provide the means of individual problem solving in a given program, the feedback from respondents is helpful in assessing the degree of workability of the system, providing further explanation on particular aspects of the system, and detailing flaws in mechanics or explanation which can then be corrected.

Data Collection and Evaluation

The following is an example of the interactive dialogue which occurred at a data collection experience during the Fall Report Field Test:

MODERATOR - I'd like to welcome you all to MISOE's data collection conference. Today we'll collect your reporting booklets, and ask for your reaction to the Fall Report, the process of data collection, what you think of our TERMOBS, and the potential benefits and advantages you may have seen as you became acquainted with the system. I'd especially like to welcome Superintendent Wolk, whose cooperation and assistance have made the Shawsheen field test possible.

We are particularly interested in your reaction to the TERMOBS in general, and the per cent of TERMOB coverage in each program. Therefore, we will cover programs individually, beginning with Mr. Mazman in Quantity Foods.

MAZMAN/QUANTITY FOODS: In my particular area, Quantity Foods, (it's sometimes better to call it Culinary Arts), I found that the step-by-step procedure was. very, very good. The TERMOB set-up was good. I think along with the formula in the conditions section, it would be nice to have a procedure, too. I know that the procedure is down here but sometimes with the written procedure it might help the student to co-relate recipes with procedures. I hope that there will be a procedure included. I thought that coverage was fairly good. I found some areas needing some additional TERMOBS. I have added 2, 4, 6, 8 here and a couple others that I'm working on. I thought that senior students should all be familiar with every area possible. Like roasting of turkey which would be poultry, potatoes - I added a few TERMOBS here - 5 potato recipes such as hash browned, something like lyonnaise. I also added one for rice pilaf, which is very often on a lot of menus now. I noticed that was lacking. I found that we had a thick soup and a special soup, but we didn't have the regular vegetable soup - in other words a soup made from stock. This would be good to help students with all their other soups. I added a nice Italian antipasto as an appetizer.

MODERATOR - So you contributed a lot of additional TERMOBS.

MAZMAN/QUANTITY FOODS - Yes, but I found that the format was very, very good. The TERMOBS didn't need too much work, a few that I basically changed. I thought you did a very nice job.

MODERATOR - You don't see any problems developing full coverage, then, in the culinary arts program?

MAZMAN/QUANTITY FOODS - As I understand it, the instructor will have this, and the student will have the formal procedure - he will work with it and the instructor will come by and check him off, is that correct?

MODERATOR - That's correct. The procedure you've just described is a very logical one and a very good one but really what you actually do (and what Shasheen as a whole would do) with the TERMOBS is really totally up to you. We're not telling you that you have to use a particular TERMOB or use it in any particular way. It is just the information we will be disseminating to all of the schools to use as they wish.

MODERATOR - Shall we continue with Mr. Polumbo in Electronics.

POLUMBO/ELECTRONICS - In general I found that the development of the TERMOBS is good. The construction TERMOBS are very good. Our students could take a diagram (schematic) and have no problem in assembling or constructing the TERMOBS as they've been written out. TERMOB numbers 14 through 22 deal with the design of particular circuits. Well, in design I think of engineers and associate engineers. Our student technicians are not required to design a circuit. They are required to go to a reference material and copy a circuit and build it. Your TERMOBS ask them to research the information and find the circuit that is equivalent to your requirements - no problem, we're doing that. With that in mind I commented on the design group of TERMOBS which are about 7 or 8 - yes, 8.

On electronic testing - no problem. Our students should be capable of performing all of the testing TERMOBS which are listed here.

MODERATOR - What about TERMOB coverage of the program?

POLUMBO/ELECTRONICS - Overall coverage? There is more that can be added. For instance, we get into TV stuff - RF amplifier could have been covered. FM frequency, FM communication, ratio-defective circuits that are within the TV set, oscillators, etc. Those should have been covered in the objectives before the student is asked to repair a black and white TV set or a color TV set.

MODERATOR - We have encountered this problem in the electronics program. The coverage could be better. We certainly plan to work on that. Do you see any impediments to developing full coverage in the electronics field?

POLUMBO/ELECTRONICS - No, they just aren't there now. I've added additional 2.01 statements of general performance, all related to computer technology, which is material we cover. I added those 20 and I gave you a reference textbook which you can refer to for additional information. In trouble shooting - we can't expect one of our students to go out and trouble shoot a radio direction finder or loran or radar. They do not get the instructional coverage here. In order to trouble shoot a radar set the student should be versed in microwave communication. We don't get into that. Mainly, because the equipment would be very expensive. It's actually another field. Safety - you should have stressed safety a lot more. I don't think anywhere is it stated. In fact, in the tool box did not include a pair of safety glasses. Whenever they are working around machinery or soldering, they definitely should have safety glasses - that wasn't stressed.

MODERATOR - We can certainly take care of that in the coming months.

POLUMBO/ELECTRONICS - I think the informal atmosphere here helped us a lot because it has made it a lot easier to ask questions, to communicate.

MODERATOR - Well, we hope so. I don't want to begin to lecture, but, connecting programs with enrollments with job-entry skills by student group, is really what our information system does. It provides all different kinds of information that can be useful, not only to teachers but to department heads as well, and to the superintendent on that level, and to the State. I'd like to ask Superintendent Wolk, just from the brief exposure you've had with the system, and based on what you've heard so far, do you think that the system, if implemented, would be of value to you at Shawsheen?

SUPERINTENDENT WOLK - I think it would be of value to us here at Shawsheen. For one thing, it would fulfill a requirement that I've felt is long needed and that is, as the student graduates from a certain program, what does he know? For example, we give a student a diploma and it says carpentry and that's all, but specifically this doesn't tell the employer anything. I think what is developing here ought to be incorporated a step further into our graduation, either a diploma or a memorandum going out, saying, okay, here is a student in say, auto-body or electrical, what he is doing in auto body, what he is working on in the class. So I think these performance objectives would actually carry through and we could say to the employer - this student is not only a graduate of the electrical department, but these are the actual job-entry skills he has acquired. This would be of great value. The other thing is that any time you have a test or a program like this, the question is how do you validate it and to me the next step that I would think essential before you complete the whole operation is to take this out into industry, go into a body shop and say, here are the objectives - is this in keeping with the type of job work that you consider normal. And one of the reasons we have certain programs in this school is

because employers have complained that in certain areas, the students are not being trained to the level that would be of value to them in their normal operation. An example is the secretarial sciences. So it would seem to me in order to validate this whole program you should actually make a random selection and go out into the industry and say 'Here we have performance objectives - how does this tie in with your requirements?' It coincides with what you are developing here.

I think you have a very good instrument. I'm quite pleased that we're a part of this field test because sometimes we have situations where some teachers are versed on or have a particular liking for a certain phase of their operation and they're concentrating on that and the next thing you know, when their students go out into the world of work, they find that they're not trained in all of the basics. For example, you may have a man in carpentry who has a hobby of boat building or something like that. The next think you know his students can only build boats. Now you have some situations like that and I think your system would actually put everything down on paper so a program could be evaluated.

MODERATOR - From an organizational point within the school, say, for number of TERMOBS accomplished over a given time such as using Progress Record Charts or whatever, do you see values there?

SUPERINTENDENT WOLK - I see some very positive values because this is implementing a step beyond the progress record chart that has been used for a number of years by the Division of Occupational Education. I think it is essential that we are able to chart or actually find out where a student is as far as performance is concerned. It would also help us because we realize that we're fortunate since we're able to provide individualized instruction to students in the shops, and they will reach differing levels of performance. Some can't go any further and others can, and I think that this ought to be indicated

at the end of an occupational program so that when these people are ready to go out into the world they know what their skills are. I think it would give the employer an indication as far as what the capabilities are of each individual.

MODERATOR - As you mentioned before, there is value in using the TERMOBS in report cards and diplomas. What about advisory councils or advisory committees in terms of updating curriculum or expanding it - what do you think about that?

SUPERINTENDENT WOLK - You're discussing something that I've been recently involved in. In Chapter 74, Section 6, I think there is a section where we're required by the State to have craft advisory committees and to me this is extremely important. It's the same as with potential employers - class advisory committees try to work with our people and we generally try to have our meetings twice a year, possibly three times a year. We have advisory committee members come in from industry and meet with our teachers and others to discuss what the newest developments are, what industry is looking for, and what is becoming obsolete, if you want to say that. I think it's important that we know what is becoming obsolete and what is new that is coming along, so that we can adjust the TERMOBS in that particular respect.

MODERATOR - We have a whole subsystem of our information system called the Sample Data System which we haven't gotten into during this data collection, but a part of the Sample Data System is a product impact section which follows selected students (on a scientifically sampled basis) through the first five years of post-graduate life experience. In other words, through jobs, etc. There is also a ten year follow-up to make a connection between the training that they've gotten through TERMOBS and so forth and what they've actually done with it, not through one job but maybe through 3 or 4 jobs. Do you see any value in this?

SUPERINTENDENT WOLK - I think there is value but I think the fact has to be taken into consideration that there are so many factors that affect the student once he

graduates. For example, he may go into the service, he may have a trade, and then he may be trained in something else because there isn't any opportunity; or he may be trained as an expert in a particular field and then has an opportunity to go into business. So then, the question is, if you train a student as an electrician or a carpenter and then he goes into the real estate business or insurance business, do we say that the program is a failure? I don't think we can. We know that in a nation-wide study that was done in 1965, they found there were quite a few students who graduated from vocational school who changed their occupations - not because they couldn't find any jobs, but because they simply felt like doing something else. I feel very strongly about this. What we're doing is giving our students an opportunity to enter the world of work with a skill. Once they have gone into the world of work and they've established themselves, then fine, they have enough confidence and they might want to do something that is altogether different. They can always go back to their skill. I think it is rather an interesting situation but I don't think we can be rigid and say, the five year follow-up is this: if 60% are working at the trade, we consider that we failed somewhere along the line.

MODERATOR - Some people have brought up the possibility, and of course the possibility does exist, that the State could come in and randomly sample-test students in a given program. Since the TERMOBS can be used as criteria-referenced tests, an achievment level index could be developed per school, per program. Does anyone, and this is open to anyone, does anyone find that threatening at all?

SUPERINTENDENT WOLK - It may be a question of threatening but I think the question here is that internally we'd be interested in achievement level. I question whether or not we want to get that information from outside in view of the fact that it may not be interpreted in the proper light. This is the thing. I'm always concerned about statistics. You can always turn them one way or the other. One thing I'd

like to emphasize on any kind of a project like this, is that if I'm a shop teacher, I have my hands full in operating the shop, I don't want to get tied down with a lot of paper work, a lot of reports and a lot of follow-up. I think this is an important factor. Whatever forms you have should be made so that they can be filled out quickly and without taking each man 45 minutes a day to actually complete the thing. I know what can happen when a man is in a shop, he gets tied up in a particular operation or he's helping or he's doing something, and the next thing you know he lets the records go until the end of the week and then spends maybe 2 or 3 hours in order to catch up. It becomes an awkward situation. That's why I think it's extremely important that whatever instrument we use is developed to the extent that it becomes very efficient, brief and gives us the information we want, period.

MODERATOR - I want to stress the fact that we wouldn't be stopping by, knocking at your door every year, requiring the amount of information that you have very generously provided us with this time. Since we're still validating our information system, we have called on your teachers for an awful lot of work and time and while it is appreciated, we certainly realize that this could not go on every year. The contact with teachers throughout the State, when the system is implemented, would be basically on a once-a-year basis for the purpose of updating and revising our TERMOB coverage. Even if we could develop full coverage in every program at the present date, 1974, it could very quickly, (especially in some programs such as Electronics and really in many others as well) become frozen in, because there would be nothing new added to it. TERMOBS would become a series of set standards and this is bad. We plan to develop full coverage in all programs so that schools are in no way obligated to teach all of the TERMOBS we have developed for a given program. As I have explained to Mr. Mazman, this is totally up to the school, up to you, as far as what you want to

include in your given program and if the State were to run an evaluation of your program, we would not test your students on a TERMOB that was not included in their program. It would be your choice. Of course, TERMOBS could be used internally for evaluation.

SUPERINTENDENT WOLK - I might add one little point. You mentioned about having an evaluator once a year. This would be a natural to fit into our summer special improvement program as a unit, so that if a group of electronic teachers are meeting from all over the state, they could take maybe one session and actually make an evaluation and update the TERMOBS, and I think this way would be a natural way to actually keep this thing current. I'm going to have to leave now but I want to say that I very much approve of what you're doing. Maybe when I'm gone everyone will speak more freely.

MODERATOR - Thank you very much for coming, Mr. Wolk, we do appreciate it. Mr. Woolverton, what's going on in automotive mechanics? Good, bad or in between?

WOOLVERTON/AUTO MECHANICS - I find that the selection of TERMOBS was very complete. I feel that they cover about 80% of what I like to do in my programs. There are some TERMOBS in some areas that could be updated. I would also like to see a little more detail in some. On the other hand, some of the TERMOBS seem to be a little over-structured as far as our type of work is concerned because we can't select the exact type of work we want every day. We have to be fairly flexible along that line so it would require a great deal of juggling of a given TERMOB. I think if you looked at the system as an overall thing, TERMOBS would be helpful in carrying out a curriculum, especially with a new teacher.

MODERATOR - That's a good point - someone mentioned that at one of the other schools: that this system, fully developed and implemented, would permit a new teacher coming in to see at a glance all the hands-on behavioral skills involved in your particular program. This would certainly be a great help in making new

teachers adapt quickly to the instructional program and curriculum here at Shawsheen, which could possibly be very different from the school where they had taught previously. What about coverage? You thought it was about 80%?

WOOLVERTON/AUTO MECHANICS - I think the program as it stands now needs about 15% to 20% updating. Certain parts I think were irrelevant, a few are obsolete and some just naven't been put in because they're too new. Now every year the auto industry adds new machinery, or redesigns versions of old machinery, and a bunch of things pertaining to electronics - ignition, etc. So you see the need for constantly updating.

MODERATOR - Yes, this updating of TERMOBS will be done every year.

WOOLVERTON/AUTO MECHANICS - I have one other comment. If someone came in to evaluate my program as per TERMOB I would prefer the evaluation be at the end of the program rather than somewhere in the middle.

MODERATOR - Right, it would have to be at the end of the program because our whole system of TERMOBS, (Terminal Performance Objectives) is designed to describe the skills acquired by completors of an occupational program.

Mr. Walton, how are things in Woodworking?

WALTON/WOODWORKING - There were many things (TERMOBS) in here that were the same as I do in my program. I did find the woodworking end of it very accurate. I made some changes in performance and I disagreed with some of the times allowed to complete an operation or TERMOB. A lot of that time element is way off.

MODERATOR - What would you say about TERMOB coverage to begin with, before you made your additions?

WALTON/WOODWORKING - 85% - very close.

MODERATOR - Mr. Puopolo, in Metalworking.

PUOPOLO/METAL WORKING - I find the description of the elements in operation all set up correctly. In the welding program, you didn't include pattern drafting.

I added coverage in that area. Under annealing, you should have had structural annealing, preheating and post heating.

MODERATOR - What did you think of the overall TERMOB coverage?

PUOPOLO/METALWORKING - Very good. About 80%.

MODERATOR - Mr. Ayer, what's the situation in General Office and Secretarial?

AYER/SECRETARIAL - I think from the management point of view this is an excellent approach to take for determining if students can actually meet the requirements of their work. I found as I went through the TERMOBS that, especially in some of the typing and transcription areas, the time sequence was way off - an hour and a half to do one letter when it should take 10 minutes. We discovered that in the bookkeeping area that you should go on into typing up a balance sheet and go into the trial balance preparation. We discovered from our placement bureau that a lot of our graduates end up in an office where they have to do this. I am in the process of going back and forth and straightening these things out. I've got a long way to go. 46 TERMOBS is not enough. I think that if we have a number of other people working on this we can finally get it together. It just needs completing. I think this system is a tool either from the administration or even the department head's point of view, or from the teacher's point of view, as to the effectiveness of the curriculum, how much is really getting through to the kids.

MODERATOR - Mr. Kaufmann, in Auto Body.

KAUFMANN/AUTO BODY - My particular field, auto body, on all TERMOBS I really can't say the hours required to do the job are right or wrong as I have to see the car. There's a big difference in repairing a bumper on a VW and an American car. I changed the condition statement to read all cars instead of just American cars. We work on foreign cars as well. It's hard to tell a student to fix a dent 2 inches deep and how long it's going to take him to fix it. You know you can't say that - you more or less have to see it. In finishes, I saw all you had down was

lacquer and very few places do lacquer-paint jobs any more. They have enamel and acrylic enamel, so I put down a few TERMOBS for that and decaling, striping, as well. I didn't go into any fancy paint jobs because we don't do that here. The coverage, I'd say, was about 80% of the program. The coverage was good except, like I say, the timing - you really can't tell. So I left the time open - I think I changed one or two that were way off.

MODERATOR - You made those changes.

KAUFMANN/AUTO BODY - Yes, and I added extra safety items in the tool kits. There was no safety structure stressed in any part of it. And we are just getting to the point now where we find that most of the tools we use are very noisy, and we are going to have to give our students ear muffs or something to cut down the noise because it is way up above what it should be. And the safety glasses - that was left out. I didn't add anything in particular about hearing. I added the safety glasses. Overall, my program was certainly very well made out as far as TERMOBS go.

MODERATOR - Mr. Kummins in Electrical.

KUMMINS/ELECTRICAL - Well, the TERMOBS are satisfactory and easy to follow. One of the questions that I want to bring up is the use of DC or direct current today. My experience in DC is very limited - on Beacon Hill many, many years ago. There is very little DC equipment around here, or in construction. The only place you will run into DC is in a factory employing a certain machine that has alternating current in the machine and changes with the use of a converter. I know of one particular school where they don't teach any DC at all. Of course, the fact that my experience in DC is limited limits my ability to teach DC in the school. Another thing that I noticed is that there is continual reference made to 220 volts or single phase-three phase. It should always read 208/220 because you have two types of systems - single phase and three phase - and the equipment manufactured will operate satisfactorily on 208 or 220.

MODERATOR - So you made those changes?

KUMMINS/ELECTRICAL - Right. I noticed a lot of confusion between conduit and service entrance cable on servicing and I made the necessary changes there. Some of the TERMOBS I deleted because, for instance, in wiring of motors and motor control, you normally do not use non-metallic sheet cable with the steel tool or a rigid conduit. Some of these TERMOBS, instead of being listed under individual wiring methods, such as Romex conduit and so forth, should be listed under one, as "wiring methods" and the individual will pick the wiring method or be assigned the wiring method.

MODERATOR - Did you make that notation?

KUMMINS/ELECTRICAL - Right, but I thought it was a little weak in motor control.

MODERATOR - What would you say the coverage is?

KUMMINS/ELECTRICAL - 80%. I'll tell you another thing that was left off in the appendix of tools - flashlight - that should be a basic electricians tool. The flashlight should have a removable back so that it could be used as a continuity tester. There was very little mention made of relays and I put that in and I added one instructional division on electric heat and an instructional division on tools. Not basic tools but hand knockout punchers, hydraulic bending, which we do in the shop, and anchoring methods. How to anchor something to various types of surfaces such as concrete or steel, etc.

MODERATOR - Do you see any value from an organizational point of view to you and to the teachers?

KUMMINS/ELECTRICAL - Yes, I'd like to incorporate some of this next year, and I think that, well, this is my first year in 11th and 12th but say if I had 10 years in 11th and 12th, I could say it covers 60% of my program whereas today I'd say it covers 80%.

MODERATOR - Mr. Bazzinotti, how are things in Machine Shop?

BAZZINOTTI/MACHINE SHOP - I thought it was good. It didn't cover the trade completely because as you brought up earlier the state of the art is constantly changing. I don't think it's the quantity of the material you have here, but the cross-section is what you want. The cross-section is great. The coverage from a manager's point of view - would I hire a guy if he could do these things - I thought was excellent. I thought it was clear and well written for the most part but I'd like to see a little more on numerical control in there because that's a big part of the trade. There were just 2 or 3 TERMOBS on numerical control, and I don't think you could call that a cross section on numerical control. I would say it covers 90% of the trade and you have a very good cross-section. You've covered the standard machine shop operation (as we know it in this area) that specializes in the manufacture of small precision parts.

MODERATOR - Now this question is open to anyone. What do you think of sharing the information that you have contributed and other teachers have contributed throughout the State, across the State. What do you think of that idea? If the system were implemented and each year you were to update and bring the State's coverage up to par - you would make your additions. It wouldn't be an exhaustive kind of thing but it would involve some of your input. Would you feel that you were doing the job for somebody else, for some other teacher, since your input would then be disseminated throughout the State?

BAZZINOTTI/MACHINE SHOP - No, I feel that we should share information any way we can. I feel that anything we discover here and find it works, if somebody is interested in it, I don't know any teacher in the school who wouldn't be willing to share anything with another school if they called us. But, I think if there was a central pooling of knowledge, it would be really great. Why spend money, time and effort doing the same thing? A lot of it might not be appropos to a

certain section of the state - like in this particular section, most of the machine shops specialize in small precision parts. There are a few heavy machine shops but not many. You go out to the Western part of the State, out toward Greenfield and Springfield there are a lot of heavy machine shops - big boring mills, power lathes, things like that. This trade might vary a little bit, but there is still a lot of things we could share with them and they could share with us and I'm sure that covers everybody here. I personally feel that anything we have, we'd be willing to share and I would hope that, if anybody had anything that we needed, and we requested it, that they'd be willing to share with us, rather than us having to go and develop it on our own.

MODERATOR - You brought up a good point. Say that in the Eastern part of the State, small precision parts are the prime focus by school machine shops in this area. But let's say that 10 to 15 years from now, for some reason, there was a shift in that situation, and that in this Eastern part of the State, machine shops dealing with large tools and large machines predominated. If this occurred, Shawsheen could draw from the State's overall Machine Shop TERMOB list, the overall files. I can't overemphasize how easily you could access this information, how easy it would be to get to. You wouldn't have to call up anybody, you wouldn't have to sweet-talk anybody, because this information would be available directly through a computer terminal from the State. You would have access to an entire program or an entire TERMOB division, or unit, and develop your curriculum from that point. In other words, Shawsheen would have the Machine Shop Program. Does anybody else have any ideas about that?

POLUMBO/ELECTRONICS - I think something like this is desperately needed. We went to New York a couple years back and we met some instructors down there and they have regency tests, in electronics, and students from Albany and N.Y. State are all given the same test - they've reached a certain standard and something like this

would prepare our students so that when they graduate from Shawsheen, or a school in the Western part of the State, they have received some fundamental knowledge which we can relate. They could specialize in television, computer technology, or navigational equipment or whatever it may be.

MODERATOR - You're talking about program continuity throughout the State (and hopefully, if this were ever connected up) on a National basis as well.

POLUMBO/ELECTRONICS - In reading through my Electronics magazine, I found an electronics instructor in another State who has some information and if you're interested you write him.

MODERATOR - It's really incredible that in the 1970's, with people walking around the moon, with all the technology that we can bring to bear in a given issue at a given time, that teachers in such a vital area, training the future manpower of the country, have to seek new and developing information in such antiquated methods as having to write to a magazine to find out about a new idea or concept.

AYER/SECRETARIAL - If I could interject something - technology in our area, in the secretarial, is going wild, such as dual-tape typewriters and things like this. Word processing techniques are coming in, and I am going to add about 12 different units on office machines. If our advisory committee from industry said your girls are going to need to know this new machine, I would have an opportunity to get instantly, TERMOBS relating to that machine, and just adapt them into the program. I am developing a curriculum in accounting now, and I'd be very much interested in your work-up on accounting.

MODERATOR - In other words, you can pull the TERMOBS that actually fit your geographic areas, your curriculum, what you want to do, and what your teacher capabilities are, etc.

WOOLVERTON/AUTO MECHANICS - It so happens, if you wanted to particularly inform

one segment of your class students with aptitudes for some special areas, it would be nice to be able to go and pick out TERMOBS for a specialty area. No one teacher is going to be able to specialize in every area - to suddenly, at a moment's notice, develop an entire mini-curriculum for a specialty area. But if someone shows the ability, then it is your job to try and help him develop that ability, if you can do it quickly without neglecting the other students.

AYER/SECRETARIAL - Not only that, I think it would help a department or department head or even members of the department working together. When you start talking about adding a course or section, you have to breakdown materials, equipment, space in classroom or shop, teachers assigned, etc. By knowing all the skills, all equipment, etc., needed to perform/teach those skills, you can justify the funds needed to implement a new course of curriculum addition. You won't leave anything out and have to come back in mid-year for more money.

MODERATOR - You can justify the funds logically and even provide a behavioral summary of the new section of the program that those machines and that space and those teachers would be assigned to - it's more than logical, it's right on target. Does anybody else have any other ideas in terms of the guidance area? What about communicating to students just coming into Shawsheen what a given program is all about. TERMOBS are a summary of the skills, the marketable skills, that students will be exposed to and hopefully acquire by the end of the program. We think the TERMOBS would also be of value in dealing with school committees in terms of describing logically and concisely what is going on in a given program, or, (in all programs combined), what is going on at Shawsheen.

BAZZINOTTI/CURRICULUM COORDINATOR - It's a pretty good way of showing where the money's going, and the results of the expenditures.

KUMMINS/ELECTRICAL - One point. In my program, electrical, there's a point at which the kids have to get out of the shop and into a working situation (climbing a 20 ft. ladder, or whatever) to really get a feel for the job. That's why we have

outside programs here at Shawsheen in Electrical and in Carpentry. You don't have coverage in that area.

MODERATOR - Do you see any problem in developing TERMOB coverage for those outside programs?

KUMMINS/ELECTRICAL - No.

MODERATOR - We certainly are going to get to work on that right away and develop coverage for those outside programs in Electrical and Woodworking.

AYER/SECRETARIAL - Another point you have - when it comes time for placement - all right, I've got 20 girls in the secretarial program - by utilizing these TERMOBS I can show my girls' capabilities. When I talk with the placement council I can say, 'Look, here are the girls I'm graduating. Here are their capabilities by job-entry skill.' There's some advantages here for special needs kids, too. Determining lowest point of employability, teaching kids those particular TERMOBS.

MODERATOR - Does anybody else have any ideas or comments they'd like to make? I want to say that we very much appreciate your joining us for this data collection meeting. Your comments and reaction to our system is extremely important in helping us assess it's value. We will collect all data now, and my associate will begin the collection procedure. Thank you all again for your time and effort.

APPENDIX

Overhead Slides for Introductory Presentation

1. MISOE

M I S O E

M ANAGEMENT

I NFORMATION

S YSTEM FOR

O CCUPATIONAL

E DUCATION

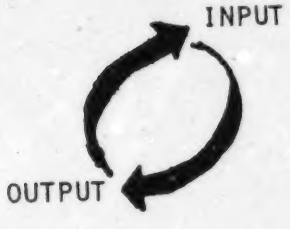
2. TEACHER'S ROLE IN MANAGEMENT

M I S O E

CONNECTS WHAT GOES ON IN CLASSROOM
WITH MANAGEMENT FUNCTION

MANAGEMENT DECISIONS
AFFECTING TEACHERS

ADVANTAGES TO TEACHERS OF DEALING MORE
EFFECTIVELY WITH MANAGEMENT PROCESS



3. COMPONENTS CENSUS DATA SYSTEM

M I S O E

CENSUS DATA SYSTEM

CONNECTS

PROGRAMS

ENROLLMENTS

JOB-ENTRY SKILLS

(TERMOBS)

NATURE AND SCOPE OF PROGRAM

USOE CODE

NUMBER OF STUDENTS

ENROLLMENT DATA

JOB-ENTRY SKILLS

TERMINAL PERFORMANCE OBJECTIVES

TERMOBS

5. JOB-ENTRY SKILLS

WHAT IS BEING TAUGHT

WHAT IS REQUIRED BY EMPLOYERS

$$\text{TERMOBS} = \frac{\text{JOB - ENTRY}}{\text{SKILLS}}$$

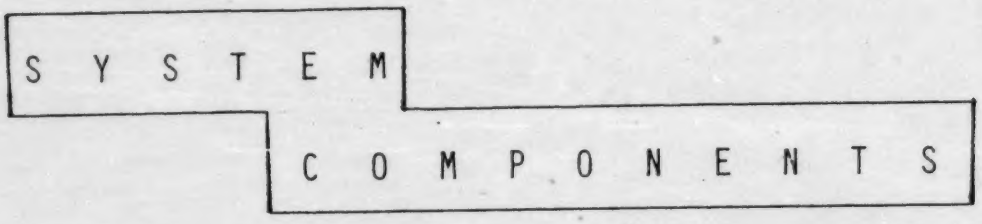
6. COMPARISON CHART

	SCHOOL A	SCHOOL B	
USOE	17.0302	17.0302	INPUT
ENROLLMENT	25	25	
COST PER COMPLETOR	$4400	$3000	
JOB-ENTRY SKILLS (COST JUSTIFICATION)	55	35	OUTPUT

AUTOMECHANICS PROGRAM

(HYPOTHETICAL EXAMPLE)

7. TERMOB INSTRUCTIONAL CONNECTOR



(1) TERMOBS

(2) INSTRUCTIONAL DIVISIONS & UNITS

(3) TERMOB DIVISION & UNITS

8. AUTO MECHANICS TERMOB

1.00 CONDITION

( ) 1.01 A LATE MODEL AMERICAN MODEL AUTOMOBILE WITH DISC BRAKES
( ) 1.02 BASIC MECHANIC'S TOOLS
( ) 1.03 SERVICE MANUAL
( ) 1.04 REPLACEMENT BRAKE PADS
( ) 1.05 LATHE
( ) 1.06 BRAKE FLUID
( ) 1.07 REPLACEMENT PROPORTIONING VALVE
( ) 1.08 PISTON COMPRESSOR

2.00 PERFORMANCE

GENERAL STATEMENT OF PERFORMANCE AND RESULTING OUTCOME

( ) 2.01 OVERHAUL BRAKE SYSTEM EMPLOYING FOLLOWING OPERATIONS, EACH PERFORMED TO MANUFACTURER'S SPECIFIED PROCEDURE:

( ) 2.02 REPLACE BRAKE PADS
( ) 2.03 TURN DOWN ROTOR
( ) 2.04 REPLACE PROPORTIONING VALVE
( ) 2.05 REPLACE DEFECTIVE BRAKE LINES
( ) 2.06 REBUILD MASTER CYLINDER

3.00 EXTENT

GENERAL STATEMENT OF EXTENT AND EXTENT OF RESULTING OUTCOME

( ) 3.01 BRAKE SYSTEM WORKING PROPERLY TO APPROVAL OF BOARD OF EXPERT RATERS, ALL OPERATIONS TO BE COMPLETED WITHIN FLAT RATE TIME PLUS 50% WITH PERFORMANCE OF EACH OPERATION & EACH STEP OF MANUFACTURER'S PROCEDURE JUDGED SATISFACTORY OR UNSATISFACTOR

( ) 3.02 BRAKE PADS REPLACED
( ) 3.03 ROTOR TURNED DOWN
( ) 3.04 PROPORTIONING VALVES REPLACED
( ) 3.05 DEFECTIVE BRAKE LINES REPLACED
( ) 3.06 MASTER CYLINDER REBUILT

9 - 10. TERMOB CORRECTION

1.00 CONDITION

(✓) 1.01 LATE MODEL AMERICAN AUTOMOBILE
(✓) 1.02 SERVICE MANUAL
(✓) 1.03 BASIC MECHANIC'S TOOLS (APPENDIX 1)
(✓) 1.04 OIL SEAL
(✓) 1.05 BEARING RETAINER
(✓) 1.06 GREASE BAFFLE
(✓) 1.07 BEARING ASSEMBLY
(✓) 1.08 GASKET
(✓) 1.09 AXLES
(✓) 1.10 AXLE PULLER
(✓) 1.11 _____
(✓) 1.12 _____

2.00 PERFORMANCE

GENERAL STATEMENT OF PERFORMANCE AND RESULTING OUTCOME

(✓) 2.01 REPLACE REAR AXLES EMPLOYING THE FOLLOWING OPERATIONS, EACH PERFORMED TO MANUFACTURER'S SPECIFIED PROCEDURE:

(1) 2.02 REMOVE AXLES
(2) 2.03 REPLACE GASKETS
(3) 2.04 REPLACE OIL SEALS
(4) 2.05 REPLACE BEARING RETAINER
(5) 2.06 REPLACE BEARING ASSEMBLY
(6) 2.07 REPLACE GREASE BAFFLE
(7) 2.08 REPLACE AXLES

3.00 EXTENT

GENERAL STATEMENT OF EXTENT AND EXTENT OF RESULTING OUTCOME

(✓) 3.01 REAR AXLES REPLACED ACCORDING TO MANUFACTURER'S SPECIFICATIONS TO APPROVAL OF BOARD OF EXPERT RATERS. TO BE COMPLETED WITHIN 2 1/2 HRS. WITH EACH OPERATION AND EACH STEP OF MANUFACTURER'S PROCEDURE JUDGED AS SATISFACTORY OR UNSATISFACTORY.

(✓) 3.02 AXLES REMOVED
(✓) 3.03 GASKETS REPLACED
(✓) 3.04 OIL SEALS REPLACED
(✓) 3.05 BEARING RETAINER REPLACED
(✓) 3.06 BEARING ASSEMBLY REPLACED
(✓) 3.07 GREASE BAFFLE REPLACED
(✓) 3.08 AXLES REPLACED

60

9 - 10. 2ND PAGE FOR TERMOB CORRECTION

1.00 CONDITION

(✓) 1.11 AXLE SEAL PULLER

(✓) 1.12 AXLE SEAL INSTALLER

2.00 PERFORMANCE

GENERAL STATEMENT OF PERFORMANCE AND RESULTING OUTCOME

3.00 EXTENT

GENERAL STATEMENT OF EXTENT AND EXTENT OF RESULTING OUTCOME

(✓) 3.01 REAR AXLES REPLACED ACCORDING TO MANUFACTURER'S SPECIFICATIONS TO APPROVAL OF BOARD OF EXPERT RATERS. TO BE COMPLETED WITHIN FLAT RATE TIME PLUS 50% WITH EACH OPERATION AND STEP OF MANUFACTURER'S PROCEDURE JUDGED AS SATISFACTORY OR UNSATISFACTORY.

11. INSTRUCTIONAL DIVISION AND UNIT OUTLINE

INSTRUCTIONAL DIVISION AND UNIT OUTLINE - MACHINE SHOP

CODE	DIVISIONS	CODE	UNIT
01	LATHE	01	TURNING (STRAIGHT)
		02	FACING
		03	FILING
		04	POLISHING
		05	CENTER DRILLING
		06	DRILLING
		07	REAMING
		08	TURNING (SHOULDER)
		09	KNURLING
		10	NECKING
		11	RECESSING
		12	BORING
		13	CHAMFER
		14	CUT-OFF
		15	COLLETS
		16	UNIVERSAL CHUCK
		17	INDEPENDENT CHUCK
		18	STEADY REST
		19	FOLLOWER REST
		20	FACE PLATE
		21	FORM
		22	TURNING (TAPER)
		23	THREADING (EXTERNAL)
		24	THREADING (INTERNAL)
		25	TOOL POST GRINDER
		26	TECHNOLOGY
		27	SAFETY
02	MILLING MACHINE	01	BORING
		02	DRILLING
		03	REAMING
		04	TAPPING
		05	MILLING, PLAIN
		06	MILLING, STRADDLE
		07	MILLING, SLOT
		08	MILLING, FACE
		09	MILLING, FORM
		10	INDEXING, RAPID
		11	INDEXING, SIMPLE
		12	INDEXING, DIFFERENTIAL
		13	ROTARY TABLE
		14	SET-UP, INDICATE
		15	SET-UP, EDGE FINDER
		16	SET-UP, ANGULAR
		17	TECHNOLOGY
		18	SAFETY
03	DRILL PRESS		

12. TERMOB DIVISION AND UNIT OUTLINE

TERMOB DIVISION AND UNIT OUTLINE

MACHINE SHOP PROGRAM

CODE	DIVISION	CODE	UNIT
01	BENCH WORK	01	FILING
		02	POLISHING
02	HEAT TREATMENT	01	ANNEAL
		02	HARDEN
		03	TEMPER
03	MACHINES	01	LATHE
		02	MILLING
		03	GRINDING
		04	SPECIAL
		05	PROJECTS
04	INSPECTION	01	COMPARATOR
		02	HARDNESS TESTER
		03	HAND MEASUREMENT

13. TERMOB CHARACTERISTICS

TERMOB CHARACTERISTICS

- LOGICAL, CONCISE BEHAVIORAL SUMMARY OF GIVEN OCCUPATIONAL PROGRAM
- FRESH APPROACH TO GOALS SPECIFICATION
- SAVES TEACHER TASK OF WRITING OBJECTIVES WHICH ADEQUATELY DESCRIBE OUTCOMES OF PROGRAMS
- SPECIFIED FORMAT
- FLEXIBLE, OPEN ENDED
- UPDATED, REVISED TERMOBS MEAN COMPLETE PROGRAM COVERAGE, KEEP SYSTEM FLUID, NOT FROZEN AND INSURES TERMOB VALIDITY

14. TERMOB BENEFITS

TERMOBS

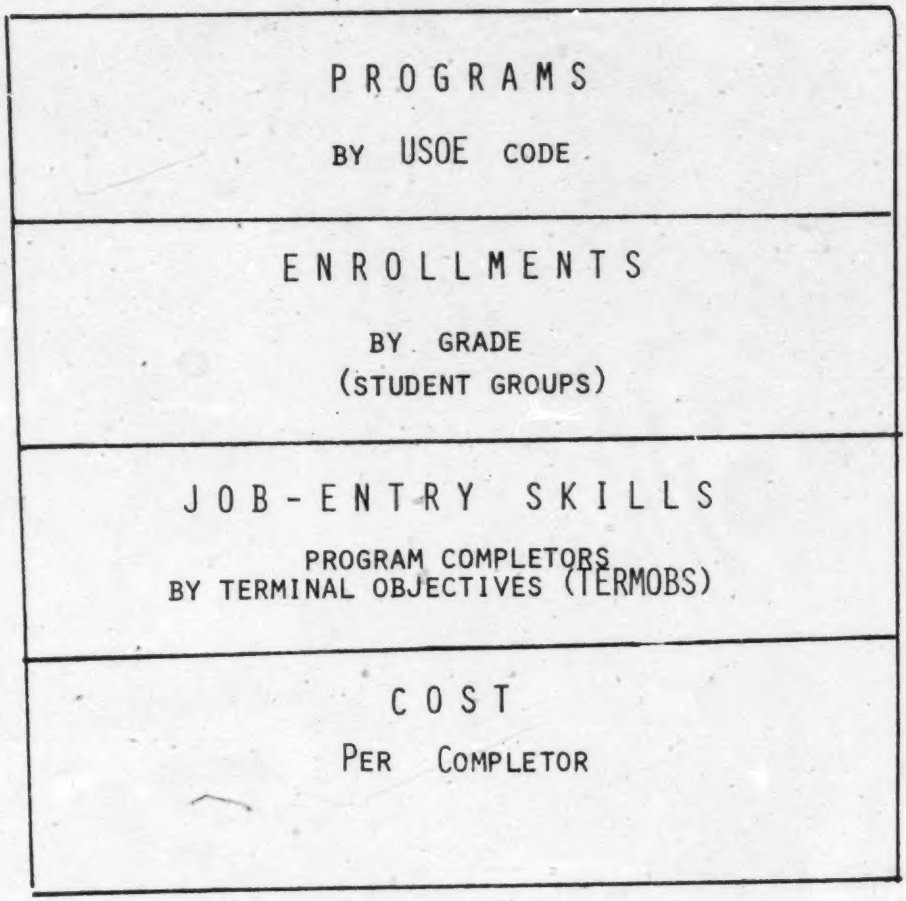
- WITH STUDENTS AND PARENTS
  PROVIDES A GRAPHIC DESCRIPTION OF PROGRAM SKILLS UPON WHICH AN OCCUPATIONAL CAREER DECISION CAN BE MADE.

- WITH ADVISORY COUNCILS
  PROVIDES A CONCISE STATEMENT OF CAPABILITIES WHICH CONSTITUTE PRESENT, FUTURE MANPOWER/SKILL NEEDS IN A GIVEN TRADE

- WITH SUPERINTENDENTS OR ADMINISTRATORS
  PROVIDES A DELINEATION OF PROGRAM OBJECTIVES ON WHICH BUDGETS, STAFF, AND EQUIPMENT CAN BE JUSTIFIED

A BASIS FOR COMMUNICATION

15. CENSUS DATA SYSTEM COMPONENTS



CENSUS DATA SYSTEM

16. COMPARISON CHART

DATA AVAILABLE NOW/DATA AVAILABLE FROM CDS

(METALWORKING)

GRADE	12
PROGRAM	17.2300
ENROLLMENT	20
COST PER COMPLETOR	$4400

GRADE	12	
PROGRAM	17.2305	17.2306
ENROLLMENT	14	6
TERMOBS	50	55
COST PER COMPLETOR	$4100	$4700
	(SHEET METAL)	(WELDING)

17. USOE CODE

U S O E C O D E

(FEDERAL GOVERNMENT'S OFFICIAL
MEANS OF PROGRAM DESCRIPTION)

"17.0302 AUTOMOTIVE MECHANICS

LEARNING EXPERIENCES CONCERNED WITH THE COMPONENTS OF THE VEHICLE, INCLUDING ENGINE, POWER TRANSMISSION, STEERING, BRAKES, AND ELECTRICAL SYSTEMS. INCLUDED IS TRAINING IN THE USE OF DIAGNOSTIC AND TESTING EQUIPMENT AND TOOLS USED IN THE REPAIR PROCESS."

"17.0303 AUTOMOTIVE SPECIALIZATION

LEARNING EXPERIENCES WHICH EMPHASIZE MORE DETAILED TRAINING IN THE ADJUSTMENT AND REPAIR OF INDIVIDUAL COMPONENTS AND SYSTEMS OF THE AUTOMOBILE, SUCH AS THE RADIATOR, TRANSMISSION, CARBURETOR, AND BRAKE SYSTEM TO ACHIEVE GREATER PROFICIENCY IN THE SERVICING OF SELECTED COMPONENTS."